



Lignite Fuel Enhancement

Quarterly Technical Progress Report:

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Lignite Fuel Enhancement

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Abstract

This 3rd quarterly Technical Progress Report for the Lignite Fuel Enhancement Project summarizes activities from January 1st through March 31st of 2005. It also summarizes the subsequent purchasing activity and final dryer/process design.

Acknowledgement

The authors wish to acknowledge the contributions and support provided by various project managers: Dr. Sai Gollakota (DOE), Matt Coughlin (Barr) Dave Rian (Barr), John Wheeldon (EPRI), Tony Armor (EPRI) and Mark Ness (GRE).

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Executive Report

Progress:

The Design Team continued to conference this quarter. Their primary task during this timeframe was to finalize the dryer instrumentation (numbers of devices/type) and their locations as they pertain to the test protocol. EPRI developed the dryer test plan and Black & Veatch will be doing an overall plant instrument survey. Heyl-Patterson selected Central Machine of Minot, North Dakota to fabricate the dryer. Heyl-Patterson will be finalizing the drawings based on instrument locations. Jeff Morris, Heyl-Patterson engineer, and Charles Bullinger, Great River Energy Project manager, visited the NETL in late January and briefed Mssrs. Markel, Sarkus, and Golakotta on the project details. Process diagrams, P&ID's, and dryer design drawings were shown. System layouts and recent photographs of the site were also discussed. Project cost options were also relayed by Mr. Markel and Ms. Zysk. Three inlet airlocks were reduced to two and four outlets were reduced to three. The inlet plenum was subdivided for greater flexibility and sparging air added in the outlet plenum. It was also decided to use bundles with varied material, diameter, and tube & fin spacing. This will be completed in an effort to identify for us which configuration has the best heat transfer characteristics using coal as the fluidizing medium. The dryer will also be delivered in four pieces. This will allow for installation through the current access door on the Air Heater deck. The Input/Output list and functional description was completed and forwarded to Honeywell to finalize controls.

Major pieces of equipment received this quarter were the Bucket Elevator, Liewell Screen, conveyors, and Motor Control Center. ICI completed removal of the wall separating Silo 28 from the dryer area; handrail and grating between the two areas has also been removed. They relocated a blowdown line. They moved an Air Heater basket access hatch.

Headwaters Energy Incorporated was selected to market the drying technology. GRE has had a long relationship with Headwaters; they have marketed our fly ash for 10 years. They recently marketed a liquefaction technology in the Far East.

Invoices #5 & #6 were submitted and approved.

Charles Bullinger and Tony Armor (EPRI) gave a brief presentation of our technology to EPRI Program 66 (Future Coal Generation Options) advisory committee. An overview of project plans was explained with emphasis made on our belief that this same technology should help those who've switched to PRB regain their lost performance margin!

Problems Encountered:

Two problems presented last quarter remain. The dryer and controls pricing was much higher than estimated. The dryer quote is about twice estimated and the controls were much over Barr's \$10,000 estimate. Having said that our electrical team decided to purchase a control system that was compatible with our current plant Honeywell backbone which will be compatible with commercial design! This compatibility, although seamless in Coal Creek's operation & maintenance adaptation, resulted in a more sophisticated approach versus Barr's estimated PLC. The second problem involving Lehigh University continues to evolve. Dr.Saranac met in Elk River, MN, GRE headquarters in February and left with assignment agreement details agreed to on that day with Mssrs. Finley & Bullinger. Upon his return to Pennsylvania however his leadership was not in agreement and re-submitted it with changes unsuitable to GRE. Each time their responses are delayed. Each time apparent agreement is made verbally but not followed through on the documentation. GRE sponsored but has yet to receive all reports from Lehigh's water reduction DOE Project DE-FC26-03NT41729, "Use of Coal Drying to Reduce Water Consumed in Pulverized Coal Power Plants".

Plans for the next reporting period:

The Dryer was ordered in January and delivery is expected in 15 weeks. Central Machine, Minot, ND was selected to fabricate the dryer and began their work in March. Fabrication will continue through delivery next quarter. A Control Room was ordered to house the Honeywell system and all interface to process instrumentation. A cooling water blowdown line was moved to the east wall to make room for the “wet” coal conveyor. Liewell screen, crusher, and Silo outlet chute landings were all completed. Millwrights will install this equipment next quarter along with bucket elevator and conveying equipment. Work began on Phase 1 extension paperwork and compilation of an Interim Project Design Report.

Prospects for future progress:

The prospects are quite good that all the next Quarter deliverables will be met. Many pieces of equipment are planned for installation along with the Motor Control Center. At that time wiring will be checked by electricians. Baghouse support steel delivery and subsequent exhaust fan/baghouse installation may delay erection of that end of the project. Honeywell received our functional description and input/output list and plans to deliver controls in July.

Experimental Apparatus:

Details of the dryer and system, P&ID's, schematics, and drawings contain "Limited Rights" information which cannot be disclosed at this particular time.

Experimental & Operating Data:

Demolition and Construction phase currently ongoing therefore no data to report at this time.

Data Reduction:

No data

Hypothesis & Conclusions:

Hypothesis remains the same. We will be able to dry lignite an increment to benefit the performance of and reduce emissions from a coal burning electric power generating station.